# SECTION 1730
# FIBER-OPTIC CABLE

## 1730-1 DESCRIPTION

Furnish and install single mode fiber-optic (SMFO) communications cable and drop cable assemblies, fiber-optic cable storage racks (snow shoes), communications cable identification markers, lashing wire and all necessary hardware.

## 1730-2 MATERIAL

Refer to Division 10.

| Item | Section |
|---|---|
| Cable Identification Markers | 1098-10 |
| Fiber-Optic Cable | 1098-10 |
| Lashing Wire and Hardware | 1098-6 |
| Storage Racks | 1098-10 |

Furnish material, equipment and hardware under this section that is pre-approved on the ITS and Signals QPL.

## 1730-3 CONSTRUCTION METHODS

### (A) General

Provide cable manufacturer's attenuation and Optical Time Domain Reflectometer (OTDR) testing data for each reel of cable upon request.

Install SMFO communications cable, snow shoes, communications cable identification markers, lashing wire and all necessary hardware.

Comply with manufacturer's recommendations. Install communications cable on signal poles, utility poles, messenger cable and in conduits as required to bring the fiber-optic cable into and, if necessary, out of each splice enclosure.

Take all precautions necessary to ensure cable is not damaged during storage, handling and installation. Do not violate minimum bending radius of 20 times the radius of cable diameter or manufacturer's recommendation, whichever is greater. Do not step on cable nor run over cable with vehicles or equipment. Do not pull cable over or around obstructions or along the ground.

Determine lengths of cable necessary to reach from termination-point to termination-point. Install cable in continuous lengths between approved splicing facilities. Additionally, provide a sufficient amount of slack cable to allow for an additional 20 ft of cable to be present after removal of outer sheath for termination. Measure slack cable by extending cable straight out of cabinet door.

Keep cable ends sealed at all times during installation to effectively prevent the ingress of moisture. Use approved heat shrink cable end cap. Do not use tape to seal cable ends.

Before installing cable, provide 3 copies of cable manufacturer's recommended and maximum pulling tension. Do not exceed manufacturer's recommended pulling tension. Use pulling grips containing a rotating swivel. Coil cable in a figure-8 configuration whenever cable is unreeled for subsequent pulling.

Install fiber-optic cable in separate 2" risers with heat shrink tubing or conduits. Do not share risers or conduits containing fiber-optic cable with other type cable.

**(B) Aerial Installation**

Double lash fiber-optic cable to messenger cable with one 360° spiral per foot.

Use pole attachment hardware and roller guides with safety clips to install aerial run cable.

Maintain tension during the pulling process for aerial run cable by using an approved mechanical clutch (dynamometer) device. Do not allow cable to contact the ground or other obstructions between poles during installation. Do not use a motorized vehicle to generate cable pulling forces.

Use a cable suspension clamp when attaching cable tangent to a pole. Select and place cable blocks and corner blocks so as not to exceed the cable's minimum bending radius. Do not pull cable across J-hooks.

Store 100 ft of each fiber-optic cable on all cable runs that are continuous without splices where specified. Obtain approval for spare cable storage locations. Store spare fiber-optic cable on fiber-optic cable storage racks (snow shoes). Locate spare cable storage in the middle of spans between termination points. Do not store spare fiber-optic cable over the roadway or driveways.

Install one communications cable identification marker within 36" of pole attachment points and at locations where more than one cable originates or terminates.

**(C) Underground Installation**

Install fiber-optic cable underground in conduit using cable pulling lubricants recommended by the fiber-optic cable manufacturer.

Obtain approval of cable pulling lubricant and method of pulling before installing underground fiber-optic cable.

Use a dynamometer (clutch device) so as not to exceed maximum allowable pulling tension if cable is pulled by mechanical means. Do not use a motorized vehicle to generate cable pulling forces.

Keep tension on cable reel and pulling line at start of each pull. Do not release tension if pulling operation is halted. Restart pulling operation by gradually increasing tension until cable is in motion.

For pulling cable through manholes, junction boxes and vaults, feed cable by manually rotating the reel. Do not pull cable through intermediate junction boxes, handholds or openings in conduit unless otherwise approved.

Install communications cable identification markers on each communications cable entering a junction box.

**(D) Installation of Drop Cable Assembly**

Determine length of drop cable needed, including slack, to reach from termination point to termination point.

At aerial splice enclosures, store 100 ft of slack cable on cable storage racks. At below ground splice enclosures, coil 100 ft of slack cable in manhole or junction box where enclosure is located.

At equipment cabinet end of drop cable assembly, terminate all fibers with ST-PC connectors to the connector panel. Label all connectors, pigtails and the connector panel. At the aerial splice enclosure location, cap off all unused fibers and label to correspond with the connector panel.

### 1730-4 MEASUREMENT AND PAYMENT

*Communications Cable* (____*-Fiber*) will be measured and paid as the actual linear feet of fiber-optic cable of each fiber count furnished, installed and accepted. Measurement will be made by calculating the difference in length markings located on outer jacket from start of run to end of run for each run. Terminate all fibers before determining length of cable run.

*Drop Cable* will be measured and paid as linear feet of fiber-optic drop cable assemblies furnished, installed and accepted. Sag and vertical segments will not be paid as these distances are incidental to the installation of drop cable assemblies.

No measurement will be made for terminating, splicing and testing fiber-optic cable, communications cable identification markers or fiber-optic cable storage racks, as these will be incidental to the installation of fiber-optic cable.

Payment will be made under:

| Pay Item | Pay Unit |
|---|---|
| Communications Cable (____-Fiber) | Linear Foot |
| Drop Cable | Linear Foot |

# SECTION 1731
# FIBER-OPTIC SPLICE CENTERS

### 1731-1 DESCRIPTION

Furnish and install fiber-optic interconnect centers, fiber-optic splice enclosures and all necessary hardware.

Modify existing fiber optic interconnect centers and/or splice enclosures as shown in the plans. Refer to manufacturer's recommendations for opening, modifying and re-sealing the existing fiber optic interconnect center and/or fiber optic splice enclosures.

### 1731-2 MATERIALS

Refer to Division 10.

| Item | Section |
|---|---|
| Fiber-Optic Splice Centers | 1098-11 |

Furnish material, equipment and hardware under this section that is pre-approved on the ITS and Signals QPL.

### 1731-3 CONSTRUCTION METHODS

**(A) General**

Include on the cover of each slice tray in a legible format the following information:

(1) Splice location reference number or identification information (i.e. 06-1011 tray 1 of 3, 06-1011 tray 2 of 3, etc.)

(2) Date the splice was made

(3) Company name of individual performing the splicing

(4) Name of individual performing the splicing